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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/159,397	09/23/1998	SAU C. WONG	M-10296 US	5079

27869 7590 03/03/2003

SKJERVEN MORRILL LLP
THREE EMBARCADERO CENTER, 28TH FLOOR
SAN FRANCISCO, CA 94111

EXAMINER

WHIPKEY, JASON T

ART UNIT	PAPER NUMBER
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2612

DATE MAILED: 03/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/159,397

Applicant(s)

WONG ET AL. (10)

Examiner

Jason T. Whipkey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 September 1998 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 11 December 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8. 6) ☐ Other: _____

DETAILED ACTION

Continued Prosecution Application

1. The request filed on December 11, 2002, for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/159,397 is acceptable and a CPA has been established. An action on the CPA follows.

Drawings

✓2. The proposed drawing correction filed on December 11, 2002, has been approved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

✓3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference signs not mentioned in the description: 230 (Figures 2, 8, 9, and 10), 240 (Figures 2, 8, 9, and 10), 280 (Figure 2), 528 (Figure 5), 625 (Figure 6), 630 (Figure 6), 640 (Figure 6), 645 (Figure 6), 650 (Figure 6), 705 (Figure 7), 710 (Figure 7), 725 (Figure 7), 735 (Figure 7), 760 (Figure 7), 765 (Figure 7), and 770 (Figure 7). A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference signs in the description are required in reply to

the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

- ✓ 5. The disclosure is objected to because of the following informality:
- The application number for the co-pending application referred to on page 11, line 19 is missing.

Appropriate correction is required.

Claim Objections

- ✓ 6. Claim 13 is objected to as failing to comply with 37 CFR 1.75(a) for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claim recites the limitation "the write circuits" in lines 15 and 18. There is insufficient antecedent basis for this limitation in the claim. The claim lists the components of *each* write pipeline, which includes "a write circuit" (line 7).

The examiner believes that lines 13-19 of claim 13 are indented more than the applicant intended, as the indentations render the timing circuit and charge pump part of the write pipelines — a limitation not supported by the specification. The examiner will therefore treat the claim as if the memory comprises a plurality of write pipelines, a timing circuit, and a charge pump, wherein each pipeline consists of an array of cells and a write circuit.

Correcting the indentation as described will rectify the insufficient basis objection.

- ✓7. Claim 17 is objected to because of the following informality: Line 3 refers to "the time circuit," when "the timing circuit" is assumed to be correct. Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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9. Claims 15-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

✓10. Claim 15 recites the limitation "the selection circuit in the even numbered pipeline" in lines 10-11. There is insufficient antecedent basis for this limitation in the claim. For examination purposes, the examiner will treat the claim as if it reads "a selection circuit in the even numbered pipeline."

✓11. Claim 15 recites the limitation "the second voltage" in line 11. There is insufficient antecedent basis for this limitation in the claim. For examination purposes, the examiner will treat the claim as if it reads "a second voltage."

✓12. Claim 16 recites the limitation "the threshold voltage" in lines 13-14. There is insufficient antecedent basis for this limitation in the claim. For examination purposes, the examiner will treat the claim as if it reads "a threshold voltage."

Claim 17 is rejected as being dependent on claim 16.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claims 1, 3-7, 10, 12, 18, 19, and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Roberts.

Regarding claims 1 and 18, Roberts discloses a still video camera with a CCD 1 shown in Figure 2. The system includes sample-and-hold circuitry 18 for receiving and storing analog data from CCD 1 via pixel multiplexer 7 (Figure 5A) (column 7, lines 7-10). Image data is processed and transmitted to processing and compression circuits 10-12, as shown in Figure 5A.

Regarding claim 3, the analog data received by the sample-and-hold circuitry 18 is image data (column 4, lines 38-43).

Regarding claim 4, the processing performed on the image data retrieved from sample-and-hold circuitry 18 includes an analog-to-digital conversion by A/D converters 8.

Regarding claim 5, Roberts shows a compression processor 12 in Figures 2 and 5A.

As for claims 6 and 22, A/D converters 8 process the image data received from sample-and-hold circuitry 18 only after a conversion completion signal CC has been sent to the A/D converters by the sample-and-hold circuitry 18 (column 7, lines 36-41).

Regarding claim 7, Roberts discloses that the invention is an electronic still video camera (column 1, lines 14-15).

Regarding claim 10, Roberts discloses in column 3, lines 1-3, that Figure 2 is the structure of an electronic still camera. Figure 2 includes image processing and compression circuits 10-12.

Regarding claim 12, Roberts discloses in column 3, lines 1-3, that Figure 2 is the structure of an electronic still camera. Figure 2 includes image processing and compression circuits 10-12, CCD 1, and pixel multiplexer 7. Note that the sample-and-hold circuitry 18 omitted from Figure 2 is shown in Figure 5A.

As for claim 19, as shown in Figure 5A, red, green, and blue signals are amplified before being stored in sample-and-hold circuitry 18 (column 7, lines 7-9).

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 2, 13, 14, 16, and 20 are rejected under 35 U.S.C. 103(a) as being obvious over Roberts in view of Simko.

Claims 2 and 20 may be treated like claims 1 and 18, respectively. However, Roberts is silent with regard to the data specifications of the analog memory.

Simko discloses an analog signal recording and playback system that uses an array 13 of analog cells (column 2, lines 43-46), as shown in Figure 1. The cells may record data using multi-level storage (column 12, lines 43-46). Each column of cells in the array (Figure 3) is used to store data independently (column 5, lines 38-41). Simko teaches that, "The actual number [of columns] is not preordained, but may be chosen by the practitioner depending on signal quality desired" (column 5, lines 42-44).

More storage space allows the system to record more data at a faster speed. Using enough columns would permit any amount of data to be stored for any length of time. The advantage to using a large, high-speed memory is that it allows the user to capture an image at a higher resolution. For this reason, it would have been obvious to have Roberts' camera include a high-speed, high-capacity memory, such as the one described by Simko.

Regarding claims 13 and 16, Simko's system includes array 13 with a plurality of columns that act as write pipelines, wherein each column includes multiple non-volatile memory cells (column 3, lines 58-60). Each column includes a write column driver 15 to write data to the cells (column 3, lines 64-66). Cells are programmed using a voltage provided by high voltage source 150, which is shown in Figure 5, to produce a charge in the selected cell (column 10, lines 45-56).

Clock addressing sequencer 22 acts as a timing circuit (column 4, lines 14-30) to drive column drivers 15 sequentially (column 3, lines 64-66). A high voltage source at terminal 150 (Figure 5) provides a programming voltage. The programming voltage is applied incrementally, and comparator 66 (Figure 3) compares the voltage in the cell

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with the expected voltage after each increment (column 11, lines 35-56) to verify the contents of the cell.

Official Notice is taken that charge pumps are a common way to produce a voltage higher than a provided supply voltage. Since Simko is silent with regard to how this high voltage is produced, it would have been obvious to use any high voltage generator suitable for programming memory cells, such as a charge pump.

Regarding claim 14, Simko teaches that the memory cells included in his system can store analog information (column 2, lines 43-46).

17. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts in view of Anderson.

This claim may be treated like claim 7. However, Roberts is silent with regard to placing the image processing and compression circuits outside the camera.

Anderson discloses an imaging device 14 and a computer 18 connected by a bus 16. Computer 18 may be separate imaging device 14 (column 3, lines 49-51). The computer performs image processing and compression on the raw image data received from the camera (column 12, lines 9-11, 15-16, 26-29, and 48-50). An advantage to having an external device perform image processing and compression is that the external device may have more space for processing circuitry, which decreases the power used by, and the size of, the digital camera. For this reason, it would have been obvious to have Roberts' imaging system perform image processing and compression outside the camera.

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18. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts in view of Simko and further in view of Chen.

Claim 17 may be treated like claim 16. However, Simko is silent with regard to using two banks and performing a verification cycle on one while performing a programming operation on the other.

Chen discloses a flash memory device with two banks (Figure 1). Bank 0 and bank 1 are arrays of non-volatile memory cells (column 3, lines 33-35). As one bank is being programmed, the other bank may be read and verified using verify sense amplifier 176 (column 5, lines 38-44).

An advantage to performing simultaneous verification and writing on two banks is that accurate data may be stored at a faster speed than in the case where such operations are performed sequentially. For this reason, it would have been obvious at the time of invention to have Simko's storage system perform simultaneous writing and verification using two banks of memory cells.

19. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts in view of Lin.

This claim may be treated like claim 18. However, Roberts is silent with regard to transmitting data from the memory when the digital signal processing is available.

Lin teaches an imaging device with a CCD 12 that stores image data in an analog memory array 34, shown in Figure 2. Image data to be processed is converted to a digital signal by A/D converter 14 and sent to host computer 26 (column 3, lines 55-

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59) only after the computer makes a request (column 3, lines 63-65). This process is detailed in the flowchart of Figure 5.

The advantage of having data transmitted to a processor only upon request is that the processor may operate at varying speeds without losing data or needing a buffer. For this reason, it would have been obvious to have Roberts' imaging system transmit data from memory to a digital processing system upon the processing system's request.

20. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts in view of Wright.

Claim 23 may be treated like claim 18. However, Roberts is silent with regard to the structure of the memory device used.

Wright discloses a memory device 200 (Figure 3) comprised of memory banks 211A and 211B, each including a plurality of memory cells (column 9, lines 49-55). The system uses charge pump voltage V_{ccp} to select the row to be read (column 64, lines 3-13). A charge is then applied to the cell to produce a certain voltage (column 72, lines 43-47).

When writing data, bits may be alternately programmed into banks 211A and 211B (column 22, lines 35-39). For example, if a first bit is written into bank 211A, a second bit is written into bank 211B, and a third bit is written into 211A, then programming of bank 211B begins after the programming of bank 211A has begun but before it is complete (since the third bit has not yet been written).

An advantage to using a memory system with multiple banks is that both banks may be simultaneously operative, which speeds up storage and retrieval times. For this reason, it would have been obvious at the time of invention to have Roberts include a dual-banked memory system like the one described by Wright.

Allowable Subject Matter

21. Claim 15 would be allowable if rewritten to overcome the rejections under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

No prior art could be located that teaches or fairly suggests an analog/multi-level memory with a plurality of odd- and even-numbered pipelines that perform simultaneous programming and each using one of two voltages.

Conclusion

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason T. Whipkey, whose telephone number is (703)

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305-1819. The examiner can normally be reached Monday through Friday from 8 A.M. to 5:30 P.M. eastern daylight time, alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy R. Garber, can be reached on (703) 305-4929. The fax phone number for the organization where this application or proceeding is assigned are (703) 872-9314 for both regular communication and After Final communication.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office, whose telephone number is (703) 306-0377.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231


or faxed to (703) 872-9314 for either formal or informal communications intended for entry. (For informal or draft communications, please label "**PROPOSED**" or "**DRAFT**".)

Hand-delivered responses should be brought to the sixth floor receptionist of Crystal Park II, 2121 Crystal Drive in Arlington, Virginia.

JTW

JTW

February 19, 2003


WENDY R. GARBER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600